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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,708	11/13/2001	Robert A. Jacobsen	APTI:062	9924

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EXAMINER

ROGERS, DAVID A

ART UNIT	PAPER NUMBER
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2856

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

10/007,708

Applicant(s)

JACOBSEN ET AL.

Examiner

David A. Rogers

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 13-18 is/are pending in the application.
- 4a) Of the above claim(s) 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Claims 13-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 8. It is respectively requested that the applicant expressly cancel the non-elected claims in response to this action.

Specification

2. The disclosure is objected to because of the following informality. The applicant uses the terminology “testing” when referring to the invention’s use. The invention is directed to an apparatus for inspection large structures. Therefore, it is requested that the applicant replace the term “testing” with “inspecting” throughout the application (including the claims) in order to avoid confusion. Appropriate correction is required.

Drawings

3. The drawings are objected to because the use of shading, as in Figure 12, will not reproduce in a sufficient manner should the application be allowed and issued. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.



5. Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. Patent 5,318,254 to Shaw *et al.* Claim 1 is directed to an inspection system comprising a remote controlled robotic vehicle with a sensor package capable of non-destructive testing of a structure and a control station that provides control data to the vehicle to guide the vehicle around the structure. With regard to claim 1 Shaw discloses a remotely controlled aircraft maintenance robot (reference item 20), as best seen in Figures 1 and 2. Furthermore, Shaw discloses a control station (reference item 156) to control the aircraft maintenance robot, as best seen in Figures 9 and 10. Shaw further discloses that a camera (reference item 76) mounted near the end of the outer arm (reference item 36) may be an infrared camera, a thermographic sensor, an ultrasonic sensor, video camera, or any appropriate sensor or viewing device (column 4, lines 10-13). Ultrasonic sensors are well known in the art as being capable of nondestructive inspection of structures as in the instant application. Furthermore, Shaw discloses that a probe (reference item 230) may be installed in the manifold (reference item 44) located at the end of the outer arm (reference item 36). Shaw discloses that the probe may be a probe which allows the inspection of the aircraft surfaces with the use of X-rays (column 7, lines 63-68). X-rays are also well known in the art as being capable of nondestructive inspection of structures, as in the instant application.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2856

7. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw as applied to claim 1 above, and further in view of U.S. Patent 6,477,730 to Marrero. With regard to claim 2, Shaw discloses that the main chassis (reference item 34) has an upper mast (reference item 26) and a base (reference item 28). Shaw further teaches that the mast is joined to an arm (reference item 34). As seen in Figure 1 Shaw teaches that the arm can be raised or lowered as required. Shaw further teaches that the outer arm (reference item 36) is connected to the inner arm (reference item 38) through the use of an elbow (reference item 42) and that the inner arm is connected to the mast through the use of a trunion (reference item 40). This combination allows the distal end of the outer arm, comprising an inspection tool or other appropriate device, to be easily located wherever needed by the operator. Shaw does not expressly teach the use of an extendable mast coupled to the main chassis. Marrero teaches an aircraft maintenance apparatus, as best seen in Figures 1 and 2. Marrero teaches an apparatus comprising a main chassis (reference item 40) and an extendable mast (reference item 61) connected to the chassis. Marrero further teaches an articulating arm (reference item 65 and 67) coupled to the extendable arm. The combination of extendable arms and articulating arms allows the maintenance tool (reference item 80) to be easily located wherever needed by the remote operator. In combination, Shaw in view of Marrero allows a remote operator to locate an inspection tool or other appropriate device wherever needed about a large structure. With regard to claim 3, Shaw teaches that the main chassis comprises a gas turbine engine (reference item 122) as the preferred propulsion system (column 3, lines 63-66). Shaw further teaches that the chassis comprises tracking motors (reference item 152), which are DC motors, to individually actuate the tracks (reference item 30 and 32) (column 5, lines 65-68 and column 6, lines 1-3). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of

Art Unit: 2856

Shaw with the teachings of Marrero to obtain a inspection apparatus comprising a main chassis with a propulsion system, an extendable arm, and an articulating arm to locate an inspection tool anywhere needed by a remote operator.

8. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw and Marrero as applied to claims 1-3 above, and further in view of U.S. Patent 5,633,707 to Seemann. With regard to claim 4 it is widely known that propulsion systems, including gas turbine engines, comprise at least one battery. Therefore, the apparatus of Shaw would anticipate claim 4 when interpreting the claim in its broadest, most reasonable manner. Seemann teaches a robotic aircraft inspection apparatus comprising an inspection vehicle, as best seen in Figures 1 and 2. Seemann teaches that the nondestructive inspection apparatus comprises an electric motor (reference item 24) to drive the vehicle (column 4, lines 22-31). It is widely known that vehicles powered by electric motors typically have at least one battery. Furthermore, replacing the gas turbine engines, as used in the device of Shaw, with an all-electric propulsion system, as in the device of Seemann, would be within the scope of one of ordinary skill. Furthermore, one would have been motivated to utilize an electric propulsion system in lieu of a gas turbine in order to reduce and/or eliminate the amount of hazardous exhaust fumes that exist, especially if the inspection of the large structure was to occur within the confines of a closed environment such as an aircraft hanger. With regard to claim 5, Shaw discloses that the inspection apparatus has an antenna (reference item 72) for communicating with the control station in a wireless manner. The control station further comprises several antennas (reference item 158) for communicating with the inspection vehicle. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Shaw and Marrero with the teachings of Seemann to obtain a nondestructive inspection apparatus comprising a

Art Unit: 2856

vehicle with an electric propulsion system comprising at least one battery and a wireless communications system for communicating between the vehicle and a control station.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. U.S. Patent 3,814,211 to Pamer discloses an aircraft servicing apparatus comprising a telescoping arm;
- b. U.S. Patent 5,180,122 to Christian *et al.* discloses a vehicle with a telescoping arm and a video camera to inspect an aircraft structure;
- c. U.S. Patent 5,858,111 to Marrero discloses an aircraft maintenance apparatus comprising extendable arms;
- d. U.S. Patent 6,105,695 to Bar-Cohen *et al.* discloses an automated crawler with an electric motor for the inspection of aircraft;
- e. U.S. Patent 6,220,099 to Marti *et al.* discloses a nondestructive inspection apparatus for inspecting aircraft comprising articulating arms; and
- f. U.S. Patent 6,378,387 to Froom discloses a nondestructive inspection apparatus for inspecting aircraft comprising elongating arms and an articulated inspection head.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Rogers whose telephone number is (703) 305-4451. The examiner can normally be reached on Monday - Friday (0730 - 1600).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (703) 305-4705. The fax phone numbers for

Art Unit: 2856

the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.

dar
December 2, 2002


DANIEL S. LARKIN
PRIMARY EXAMINER